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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,375	06/30/2006	Shinichiro Yamada	20692/0203861-US0	8420

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EXAMINER

TAYLOR II, JAMES W

ART UNIT	PAPER NUMBER
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4171

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/595,375	Applicant(s) YAMADA ET AL.	
	Examiner James W. Taylor, II	Art Unit 4171	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/13/2006; 6/30/2006; 3/17/2008</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 4-6, and 8 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for

(a) lactic acid resin,

(b) a metal hydroxide whose surface has been treated with a silane coupling agent wherein the mass of the component (b) is 15-40% of mass of the resin composition,

with either

(c) a copolymer of lactic acid and diol/dicarboxylic acid, wherein component (c) is 15-40% of the mass of the resin composition,

or

(d) either or both of a non lactic acid aliphatic polyester resin and an aromatic-monomer containing, aliphatic-monomer containing polyester wherein component (d) is 5-25% of the mass of the resin formulation and

(e) an ester compound with a molecular weight of 200-2000 g/mol wherein component (e) is 0.1-5% of the mass of the resin composition, does not reasonably provide enablement for just components (a) and (b) with the physical limitations given in claim 1. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. The Federal Circuit has repeatedly held that “the specification must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation’.” *In re Wright*, 999 F.2d 1557, 1561, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993). See MPEP 2164.08.

The test of enablement is whether one of ordinary skill in the art can make and use the claimed invention without undue experimentation. Furthermore, under *In re Wands* (Fed. Cir. 1988), eight factors are relevant to the enablement analysis: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

The applicant fails to teach a method for making a metal hydroxide in a lactic acid resin having a sufficient flame, heat, and impact resistance as claimed in

claim 1 without the addition of component (c) or components (d) and (e). The applicant presents 16 examples and 13 comparative examples. Out of all of the examples, none of them disclose a formulation without component (c) or components (d) and (e). Given nature of the invention and the mechanism proposed by the applicant's specification for meeting the physical limitations of claim 1 being credited to the presence of either component (c) or components (d) and (e) and no specific guidance how to arrive at these physical limitations without these additives—including the prior art and relative skill of the art as a whole providing no guidance—it is exceedingly difficult to practice the invention without said additives. The difficulty of practicing the invention without these additives is especially true when considering that the results presented by the applicant are unpredictable and unanticipated. The nature of the invention, state of the prior art, and relative skill of those in the art are such the additives are rendered essential to practicing the disclosed invention. One would be regulated to 'trial and error' with other additives to attempt to practice the claimed scope of the invention, and this constitutes undue experimentation.

Therefore, the enlarged scope of the applicant's aforementioned claims is rendering the aforementioned claims unenabled.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 (and hence 13-16) are rejected under 35 U.S.C. 112, 2nd paragraph, for failing to distinctly point out the meets and bounds of the claim.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term “aromatic aliphatic” is used by the claim to mean “synthesized from both aromatic and aliphatic monomers.” There is no general accepted meaning as the terms “aliphatic” and “aromatic” are mutually exclusive. In other words, the term “aromatic aliphatic” is an oxymoron. Although the applicant gives examples of “aromatic aliphatic” polyesters, the term is indefinite because the specification does not clearly define the term.

The examiner will treat the rest of the office action assuming the applicant meant “synthesized from both aromatic and aliphatic monomers” by “aromatic aliphatic.”

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Shimatzu Corp. (JP 2002-105298 A).

The applicant claims:

- (a) a lactic acid resin (Shimatzu, par. 1),
- (b) a metal hydroxide (Shimatzu, par. 12) treated with a silane coupling agent (corresponding to "Silang," Shimatzu, par. 13), present at 15%-40% by mass of the formulation (corresponding to 1-30%, Shimatzu, par. 12),
 - (1) an impact strength of more than 5 kJ/m² (Shimatzu, par. 1),
 - (2) a deflection temperature under load being not less than 50 °C measured by the JIS K 7191 standard, and
 - (3) the flame retardant rating V-2 or above.

The examiner takes the position that both limitations (2) and (3) will be inherently met because the physical properties between the applicant's system and Shimatzu's system are very similar.

Regarding claim 4, the applicant further claims the core of the metal hydroxide, (b), is aluminum hydroxide (corresponding to "alumninium hydroxide," Shimatzu, par. 12).

Regarding claim 6, the applicant further claims the silane coupling agent is an epoxy silane coupling agent (corresponding to "beta-(3,4 epoxycyclohexyl) ehtyltrimethoxysilane," Shimatzu, par. 13).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, 7, 9, 12 and 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimatzu as applied to claims 1, 4, and 6

Regarding claims 2, 9 and 12, the applicant's aforementioned claims further comprise:

(c) a copolymer of lactic acid, a diol, and a dicarboxylic acid.

Shimatzu fails to disclose the addition of component (c).

Shimatzu does disclose a polyester prepared by a diol/dicarboxylic acid polymerization (referred to as "Shimatzu's additive '(c)'" for the rest of this office action, para. 8-9).

Shimatzu's base resin is polylactic acid. Copolymers do many things over their homopolymer counterparts. One of the materially distinct things that copolymers help to do is break up crystallinity. With random copolymerization, it becomes more difficult for molecules to make polycrystalline or crystalline regions, and therefore, the polymer will become more rubbery. Ultimately, this will cause a formulation using the copolymer to become more impact resistive and less brittle.

Therefore, it would have been obvious at the time of invention to copolymerize lactic acid into Shimatzu's additive "(c)," forming the applicant's limitation (c) so that one will have a more impact resistive and less brittle resultant polymer.

Regarding claims 3, 7, 13 and 16, the applicant's aforementioned claims further comprise:

(d) an aliphatic polyester other than lactic acid, 5% to 25% by mass (Shimatzu, para. 8-9; corresponding to "polybutylene succinate" or "P2," Shimatzu, para. 25 and 28) and

(e) an ester compound with a molecular weight of 200-2000 g/mol (corresponding to "dimethyl phthalate," Shimatzu, para. 15), 0.1% to 5% by mass.

Shimatzu fails to disclose the range of amount of plasticizer of component (e). Shimatzu discloses the range of 5-25% by mass (para. 18).

The applicant's claimed range of component (e) slightly overlaps Shimatzu's at 5% (Shimatzu, para. 18).

The amount of plasticizer is a result effective variable. Shimatzu states (para. 18) that less than 5% of ester compound (corresponding to "plasticizer" in Shimatzu) will cause the plasticizer's effect to become small. The effect of esters as plasticizers is established in Shimatzu. Therefore, it would have been obvious at the time of invention to lower the amount of dimethyl phthalate in Shimatzu's invention to decrease the known effect of the ester as a plasticizer for relevant applications.

Furthermore, 5% is an overlapping value. Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made, since it has been held that choosing the overlapping portion, of the range taught in the prior art and the range claimed by the applicant, has been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 USPQ 549.

Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimatzu as applied to claims 1, 4, and 6 above, in view of Yagawa *et al.* (USP 5,340,867).

The applicant further claims that the metal hydroxide, (b), has a particle size between 0.1 and 5 microns.

Shimatzu fails to disclose this particle size range.

Yagawa *et al.* discloses a flame retardant polymer composition with silane-reacted aluminum hydroxide filler. The particle size of the aluminum hydroxide particle is no more than a micron (Yagawa *et al.*, col. 5, line 28).

Although Shimatzu doesn't disclose the particle size of his aluminum hydroxide filler, it would be reasonable to modify Shimatzu's aluminum hydroxide particle by substituting Yagawa *et al.*'s aluminum hydroxide particle size as he is using the aluminum hydroxide in a similar capacity.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use an average particle size of 1 micron for the aluminum hydroxide particle in Shimatzu's invention.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimatzu as applied to claims 2, 9, and 12 above, in view of Yagawa *et al.* (USP 5,340,867).

As above, the applicant further claims that the metal hydroxide, (b), has a particle size between 0.1 and 5 microns.

Shimatzu fails to disclose this particle size range.

Yagawa *et al.* discloses a flame retardant polymer composition with silane-reacted aluminum hydroxide filler. The particle size of the aluminum hydroxide particle is no more than a micron (Yagawa *et al.*, col. 5, line 28).

Although Shimatzu doesn't disclose the particle size of his aluminum hydroxide filler, it would be reasonable to modify Shimatzu's aluminum hydroxide particle by substituting Yagawa *et al.*'s aluminum hydroxide particle size as he is using the aluminum hydroxide in a similar capacity.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use an average particle size of 1 micron for the aluminum hydroxide particle in Shimatzu's invention.

Claim 13-14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimatzu as applied to claims 3, 7, 13 and 16 above, in view of Yagawa *et al.* (USP 5,340,867).

The applicant further claims that the metal hydroxide, (b), has a particle size between 0.1 and 5 microns.

Shimatzu fails to disclose this particle size range.

Yagawa *et al.* discloses a flame retardant polymer composition with silane-reacted aluminum hydroxide filler. The particle size of the aluminum hydroxide particle is no more than a micron (Yagawa *et al.*, col. 5, line 28).

Although Shimatzu doesn't disclose the particle size of his aluminum hydroxide filler, it would be reasonable to modify Shimatzu's aluminum hydroxide particle by substituting Yagawa *et al.*'s aluminum hydroxide particle size as he is using the aluminum hydroxide in a similar capacity.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use an average particle size of 1 micron for the aluminum hydroxide particle in Shimatzu's invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James W. Taylor, II whose telephone number is (571)270-5457. The examiner can normally be reached on 7:30 am to 5:00 pm (off every other Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 4171

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 4171

James W Taylor, II
Examiner
Art Unit 4171

jwt2